Helminthological Abstracts

Series A
Animal and Human Helminthology

Volume 56

Prepared by

C·A·B INTERNATIONAL
INSTITUTE OF PARASITOLOGY
ST. ALBANS HERTS

1987

ISSN 0300-8339

© *C·A·B International, 1988*

All rights reserved. No part of this publication may be reproduced in any form or by any means, electronically, mechanically, by photocopying, recording or otherwise, without the prior permission of the copyright owner.

published by

C·A·B International
Wallingford,
Oxon OX10 8DE. UK.

The information contained herein, including any expression of opinion and any projection or forecast, has been obtained from or is based upon sources believed by us to be reliable but is not guaranteed as to accuracy or completeness. The information is supplied without obligation and on the understanding that any person who acts upon it or otherwise changes his/her position in reliance thereon does so entirely at his/her own risk.

printed by
Unwin Brothers Ltd., The Gresham Press, Old Woking, Surrey, UK.

HELMINTHOLOGICAL ABSTRACTS
SERIES A
ANIMAL & HUMAN HELMINTHOLOGY

Volume 56, 1987

This journal is prepared by the staff of the CAB International Institute of Parasitology, 395A Hatfield Road, St. Albans, Hertfordshire, AL4 OXU, England.

Director: Ralph Muller, Ph.D., F.I. Biol.
Consultant Directors: Prof. G. Webbe, D.Sc., M.Sc., F.I. Biol.
N. G. M. Hague, Ph.D.
Assistant Director: P. S. Gooch, B.Sc., M.I. Inf.Sc.

Scientific staff: Caroline E. Allsopp, B.Sc., J. Bridge, Ph.D., Carole Connelly, B.Sc., A. R. Dobinson, HNC, Elisabeth Gascoigne, F.I.L., Lynda M. Gibbons, Ph.D., C. W. Gordon, B.A., M.I.Inf.Sc., D. J. Hunt, Ph.D.,F.R.E.S., Arlene Jones, Ph.D., L. F. Khalil, Ph.D., Janet E. Machon, B.Sc., Patricia M. Neenan, B.Sc., A. O'Connor, B.Sc., Rita A. Owen., B.Sc., (part-time), Sam L. J. Page, Ph.D., R. A. Plowright, Ph.D., Grazyna I. Pozniak, M. R. Siddiqi, D.Sc., Safia F. Siddiqi, B.Sc., S. Townson, Ph.D.

Supporting staff: E. Beryl Bull (part-time), Beryl Cunningham, Sheila N. Eames, (part-time), S. P. Edwards, B.A., Barbara Gibson, Audrey M. Godman (part-time), Anne F. Hall (part-time), Susan Hines, Olive Linton, A. Macarthur, Gillian Macey, Berit I. Pedersen, B.A., R. J. Tranfield.

OFFICIAL CORRESPONDENTS
THE COMMONWEALTH INSTITUTE OF PARASITOLOGY

Animal and Human Helminthology

ANTIGUA Director of Agriculture, Dept. of Agriculture, Friars Hill.
AUSTRALIA Dr. Hugh McL. Gordon, 4 Krui Street, Fairlight, N.S.W. 2094.
BAHAMAS Director of Agriculture, Dept. of Agriculture, P.O. Box N-3028, Nassau.
BANGLADESH Director, Bangladesh Agricultural Research Institute, 87 Pioneer Road, Kakrail, Dacca.
BARBADOS Senior Veterinary Officer, Dept. of Science and Agriculture, P.O. Box 50, Bridgetown.
BERMUDA Director of Agriculture, Dept. of Agriculture, P.O. Box 834, Hamilton South.
BOTSWANA Director of Veterinary Services, Private Bag 32, Gaborone.
BRITISH SOLOMON ISLANDS Senior Agricultural Officer, Dept. of Agriculture, Honiara.
BRITISH VIRGIN ISLANDS Superintendent of Agriculture, Agricultural Dept., Tortola.
BRUNEI State Agricultural Officer.
CANADA Prof. R.C. Anderson, Dept. of Zoology, University of Guelph, Ontario.
CYPRUS Dr. K. Polydorou, Director, Dept. of Veterinary Services, Nicosia.
FIJI Assistant Director of Agriculture (Animal Health and Production), Ministry of Agriculture and Fisheries, P.O. Box 358, Suva.
GAMBIA Principal Veterinary Officer, Abuko, via Bathurst.
GHANA Mr. M.A. Odei, Institute of Aquatic Biology, P.O. Box 38, Achimota.
Mr. Debrah Sapong, Animal Research Institute, P.O. Box 20, Achimota.
GUYANA Principal Agricultural Officer, Ministry of Agriculture, P.O. Box 100, Georgetown.
HONG KONG Director, Agriculture and Fisheries Dept., Canton Road Government Offices, 393 Canton Road, Kowloon (Attn: Mr. K.S. Kip).
INDIA Dr. S.C. Dutta, Division of Parasitology, Punjab Agricultural University, Ludhiana.
JAMAICA To be nominated.
KENYA Director, Veterinary Research Laboratory, P.O. Kabete.
MALAWI Senior Pathologist, Bvumbwe Agricultural Research Station, P.O. Box 5748, Limbe.
MALAYSIA
MALAYA Director of Veterinary Services, Swettenham Road, Kuala Lumpur.
SABAH Senior Veterinary Officer, P.O. Box 105, Jesselton.
SARAWAK Director of Agriculture, Dept. of Agriculture, Kuching.
MAURITIUS Principal Veterinary Officer, Agricultural Services, Reduit.
MONTSERRAT To be nominated.
NEW ZEALAND Dr. R.V. Brunsdon, Wallaceville Animal Research Station, Private Bag, Upper Hutt.
NIGERIA Director, Federal Dept. of Veterinary Research, Vom, Benue Plateau State.
LAGOS STATE Permanent Secretary, Ministry of Agriculture and Natural Resources, Trade and Industry, Lagos.
WESTERN STATE Permanent Secretary, Ministry of Agriculture and Natural Resources, Ibadan.
NORTH-CENTRAL STATE Director, Institute of Agricultural Research, Samaru, Private Mail Bag 1044, Zaria.
MID-WESTERN STATE Permanent Secretary, Ministry of Agriculture and Natural Resources, Benin City.
REPUBLIC OF IRELAND To be nominated.
ST. HELENA Agricultural and Forestry Officer, Dept. of Agriculture and Forestry, Scotland.
SEYCHELLES Director of Medical Services, Dept. of Agriculture, P.O. Box 54, Victoria, Mahe.
SIERRA LEONE Director of Veterinary Services, Teko, via Makeni.
SRI LANKA Dr. S.B. Dhanapala, Deputy Director of Animal Production and Health, Veterinary Research Institute, Gannoruwa, Peradeniya.
SWAZILAND Dr. A.M. Khoza, Chief Veterinary Officer, P.O. Box 162, Mbabane.
TANZANIA Chief Veterinary Research Officer, Ministry of Agriculture, P.O. Box 9152, Dar-es-Salaam.
TRINIDAD AND TOBAGO Technical Officer (Animal Husbandry), Dept. of Agriculture, St. Clair, Port of Spain.
UGANDA Chief Research Officer, Animal Health Research Centre, P.O. Box 24, Entebbe.
WINDWARD ISLANDS
GRENADA Superintendent of Agriculture, Dept. of Agriculture, St. Georges.
ST. LUCIA Agricultural Superintendent, Dept. of Agriculture, Castries.
ST. VINCENT Superintendent of Agriculture, Dept. of Agriculture, Kingstown.
ZAMBIA Dr. S.M. Silangwa, University of Zambia, P.O. Box 2379, Lusaka.

C·A·B INTERNATIONAL

C·A·B INTERNATIONAL (CABI), formerly the Commonwealth Agricultural Bureaux, is a cooperative not-for-profit organization owned, administered and financed by member governments. It was established in 1928, currently has 29 members, and has the status and privileges of an international organization in the UK. A new treaty-level constitution, giving CABI the status of an Inter-Governmental Organization, has received the necessary ratification by Member Countries and is now in the process of being registered with the U.N.

CABI's organizational structure comprises the Review Conference of member governments, which meets every five years; the Executive Council, with one representative from each member government, which meets four times per year; and the Directorate, including CABI Headquarters, its 4 Institutes and 11 Bureaux. The Director General is the chief executive, controlling the 410 staff, two thirds of whom are at managerial or professional level, through three Directors, for Information, Scientific and Administrative Services.

The organization exists to provide information, scientific and development services for agriculture and allied disciplines throughout the world.

INFORMATION SERVICES

The chief function of the Information Services is to provide ready access to published information on research in agriculture and allied disciplines, including rural development.

Over 100 scientists/linguists in CABI's eleven Bureaux, each one specialising in a particular subject area, scan the world literature, select the significant items, and prepare an informative abstract of each which is entered into the CAB ABSTRACTS bibliographic database. With some 2 million records in the database since 1973, and 3 million more in printed journals back to 1930, the total archive provides a unique encyclopaedic resource of unsurpassed reliability and quality.

The CAB ABSTRACTS database is publicly accessible online from major international online vendors. It is used to provide current awareness and retrospective information services in hard copy and machine-readable form. Chief among these are 46 printed abstract journals, which are taken by 10,000 subscribing organizations worldwide. New journals are started in response to changing users' needs or if sponsors guarantee the circulation. Users needing more specific information may select outputs that match their particular requirements, helped if necessary by CABI's subject experts; outputs are supplied as magnetic tape, computer printout, microfiche or floppy disk. The database is also available for testing on optical disk (CD-ROM), a new technology ideally suited to developing countries. To complete the service, photocopies of original articles are provided on request through the CABI Library Services.

Other functions of the Information Services include compilation of specialized databanks and directories, publication of primary journals, authoritative reviews and books, and training in information transfer for librarians, documentalists and information specialists.

SCIENTIFIC SERVICES

The Scientific Services of CABI are conducted by four Institutes, which provide an international service on pest identification and management. They deal with insect pests, fungal and bacterial agents, and human, animal and plant parasites and with all aspects and types of biological control of plant pests.

CAB International Institute of Entomology (CIE)

CIE provides an identification service for insects, mites and other arthropods, especially species that are of actual or potential importance as pests, parasitoids, predators and pollinators or are otherwise relevant to agriculture, forestry or related subjects. Contract research is also undertaken in these fields. The Institute's taxonomists work in the British Museum (Natural History) where they have access to the Museum's 23 million reference specimens of insects and mites, an incomparable aid to authoritative identifications and research on arthropod classification.

CAB International Mycological Institute (CMI)

CMI is the largest centre for systematic mycology in the world and provides a service for the identification of filamentous fungi and plant-pathogenic bacteria. It has about 300,000 dried reference specimens, a culture collection of more than 12,500 isolates, and extensive library, a Biodeterioration and Industrial Services Laboratory, a Biochemical Laboratory, and a Plant Pathology Liaison Unit. The Institute provides a wide range of consultancy and contract services for plant pathologists and industry. It incorporates the UK National Collection of Fungus Cultures and the Biodeterioration Centre.

CAB International Institute of Parasitology (CIP)

CIP provides an identification service for plant-parasitic and entomophilic nematodes, and helminth parasites of animals and man. The reference collections contain over 65,000 specimens, and an extensive specialist library is maintained. The Tropical Plant Nematology Advisory and Research Unit provides practical advice on plant-parasitic nematodes and their control worldwide, and the Institute also houses the WHO Filarial Reference Collection.

CAB International Institute of Biological Control (CIBC)

CIBC provides information and advice on biological control, undertakes research and implementation of programmes on biological control of major pests and weeds, and participates in integrated pest management programmes in association with other agencies. It has its headquarters in the UK but operates also from stations at Delémont, Switzerland; Rawalpindi, Pakistan; Nairobi, Kenya; and Curepe, Trinidad, West Indies.

All four Institutes carry out research, and offer a wide range of training activities from postgraduate studentships to special training courses both in the UK and abroad.

DEVELOPMENT SERVICES

The Development Services Group was established in 1986 to provide a sharper focus for CABI's consulting activities. It draws heavily on the unique scientific expertise and information resources available in the CABI Institutes and Bureaux, and its activities are backed by nearly sixty years of CABI involvement in science and world agriculture.

The Development Services offer practical advice and assistance on many pest-related or environmental problems in agriculture. Specific services include:

— project appraisal
— advice in a range of scientific disciplines
— research supervision
— research evaluation
— project implementation.

These services are offered in situations ranging from short-term individual consultancies to project components and major development projects. The current focus is on:

— integrated pest management programmes
— national crop protection services
— pest/disease identification and control
— crop-orientated pest and disease surveys.

One component of these activities that can be extended to any branch of agriculture or development is the provision of a comprehensive information service, involving expert review and analysis of all relevant literature.

HEADQUARTERS SENIOR STAFF, DIRECTORS AND OFFICERS-IN-CHARGE OF INSTITUTES AND BUREAUX OF C·A·B INTERNATIONAL

Headquarters

C·A·B International
Wallingford, Oxon. OX10 8DE, UK
Telephone: (0491) 32111
Telex: 847964 (COMAGG G)
Telecom Gold/Dialcom: 84: CAU001
Fax: (0491) 33508

Director General: Don Mentz BAgrSc, BEcon
Director, Information Services: J. R. Metcalfe MA, PhD, DIC, DTA
Director, Scientific Services: D. J. Greenland MA, DPhil, DAgSc, FIBiol
Director, Administrative Services: T. Martin FCA
Deputy Director, Information Services: C. P. Ogbourne BSc, PhD
Head, Systems Division: J. H. Gilmore BSc, MACS
Head, Marketing & Sales Division: A. J. Woodcock
Assistant Director, Administrative Services: L. D. Poole MBE
Chief Accountant: J. J. Wason ACCA

*Information Services**

Bureau of Agricultural Economics
Managing Editor: Miss M. A. Bellamy BSc, DipAgricEcon, MIInfSci

Bureau of Animal Breeding and Genetics
Managing Editor: [1]J. D. Turton BSc, MRCVS, DTVM

Bureau of Animal Health
Managing Editor: G. D. Phillips BSc, BVSc, PhD, MRCVS

Bureau of Dairy Science & Technology
Managing Editor: P. D. Wilson BA, DPhil

Forestry Bureau
Managing Editor: K. M. Becker BS, PhD

Bureau of Horticulture & Plantation Crops,
East Malling Research Station, Maidstone, Kent ME19 6BJ, UK (until April 1988).
Managing Editor: K. K. S. Bhat BSc, MSc, Docteurès Sciences

Bureau of Nutrition, Rowett Research Institute, Bucksburn, Aberdeen AB2 9SB, Scotland, UK
Managing Editor: D. J. Fleming BSc, MSc, MIBiol

Bureau of Pastures & Field Crops
Managing Editor: [2]P. Wightman BSc

Bureau of Plant Breeding & Genetics,
Department of Applied Biology, Pembroke Street, Cambridge CB2 3DX, UK (until May 1988).
Director: Miss O. Holbek BSc

Bureau of Soils
Managing Editor: B. Butters MSc, DipAgr, DTA, DIC, ARCS

Bureau of Crop Protection
Managing Editor: P. R. Scott MA, PhD

Accessions Unit
Manager: Mrs S. P. Smith BA

Publications Unit
Manager: Mrs E. V. Storrie

[1]Also Chief Managing Editor (Animal Sciences)
[2]Also Chief Managing Editor (Plant Sciences)
*Headquarters address, unless otherwise indicated

Scientific Services

CAB International Institute of Entomology, 56 Queen's Gate, London SW7 5JR, UK. Tel: 01-584-0067/8
Director: K. M. Harris DSc, DipAgrSci, DTA

CAB International Mycological Institute, Ferry Lane, Kew, Richmond TW9 3AF, UK. Tel: 01-940-4086
Director: D. L. Hawksworth PhD, DSc, FLS, CBiol, FIBiol

CAB International Institute of Parasitology, 395A Hatfield Road, St. Albans, Herts. AL4 0XU, UK. Tel: St. Albans (0727) 33151
Director: R. L. J. Muller BSc, PhD, FIBiol

CAB International Institute of Biological Control, Imperial College, Silwood Park, Ascot, Berks SL5 7PY, UK. Tel: Ascot (0990) 28426
Director: D. J. Greathead BSc, ARCS, PhD, DSc, FIBiol

Caribbean and Latin American Station, Gordon St., Curepe, Trinidad, West Indies
Scientist-in-Charge: to be appointed

European Station, 1 Chemin des Grillons, CH-2800, Delémont, Switzerland
K. P. Carl DNatSc (Entomologist-in-Charge)

Indian Station, Post Bag 2484, Hebbal Agricultural Farm, P.O. Bangalore 560024, India
M. J. Chacko MSc, PhD (Entomologist-in-Charge)

Kenya Station, c/o Kenya Agricultural Research Institute, P.O. Box 30148, Nairobi, Kenya
M. J. W. Cock BSc, ARCS, PhD, DIC (Entomologist-in-Charge)

Pakistan Station, PARC-CIBC Station, P.O. Box 8, Rawlpindi, Pakistan
A. I. Mohyuddin MSc, PhD (Entomologist-in-Charge)

Malaysian Station, CIBC, c/o Ebor Research, P.O. Box 202, Bathtiga, Selangor, Malaysia
A. C. P. Ooi, BSc, MSc (Entomologist-in-Charge)

Development Services

CAB International Development Services, Farnham House, Farnham Royal, Slough SL2 2BN, UK
Head: D. L. Heydon, BSc

C·A·B INTERNATIONAL

EXECUTIVE COUNCIL — NOVEMBER 1987

Member	*Representing*
K. TAVOLA (Chairman)	Fiji
S. UNDENGE	Zimbabwe
DR. D. W. F. SHANNON	United Kingdom
M. CHAPPELL	Canada
DR MILTON MOORE	Australia
P. BAIGENT	New Zealand
S. N. RAO	India
A. C. GOONESEKERA	Sri Lanka
F. A. TSEGAH	Ghana
MRS ZAINUL HAWANI AHMAD	Malaysia
N. C. ONIANWA	Nigeria
J. PAPANICOLAOU	Cyprus
MRS A. BALLAH-CONTEH	Sierra Leone
MRS S. N. NYANDUGA	Tanzania
F. McGILCHRIST	Jamaica
S. KANGAL	Trinidad & Tobago
B. J. OCANA	Uganda
C. M. KANGÉ	Kenya
P. KACHIMERA	Malawi
S. MUTONDO	Zambia
V. S. NDIAYE	The Gambia
C. J. E. BARKER	Guyana
C. MOGOTSI	Botswana
A. BOOLAKY	Mauritius
A. B. M. AHSANULLAH	Bangladesh
R. DEMERITTE	The Bahamas
A. P. TABERENG	Papua New Guinea
(to be nominated)	Solomon Islands
DANIAL BIN HAJI HANAFIAH (resides in Brunei)	Brunei Darussalam
R. J. WALSGROVE	Dependent Territories
DR. G. THYAGARAJAN (Observer)	Commonwealth Science Council

C·A·B INTERNATIONAL

LIAISON OFFICERS — NOVEMBER 1987

Contributing Country	*Liaison Officer*	*Address*
United Kingdom	Mr. F. G. Raymond	Head of Branch A Research and Development Requirements Division. Ministry of Agriculture Fisheries and Food, Whitehall Place, London SW1A 2HH
Canada	Dr. R. Trottier	Research Coordinator (Protection) Research Branch, Agriculture Canada, Sir John Carling Bldg. Ottawa, Ontario, K1A OC5
Australia	Dr. J. B. Allen	Commonwealth Scientific & Industrial Research Organization, P.O. Box 225, Dickson, ACT 2602
New Zealand	Mr. C. M. Palmer	Director (International Science) Department of Scientific & Industrial Research, Private Bag, Wellington
India	Dr. N. S. Randhawa	Director-General, Indian Council of Agricultural Research, Krishi Bhavan, New Delhi, 110001
Sri Lanka	Dr. I. Goonewardena	Director of Agriculture, Dept of Agriculture, Peradeniya
Ghana	Executive Chairman	Council for Scientific & Industrial Research, P.O. Box M32, Accra

Malaysia	Mr Mohamed Yasin Saleh	Principal Asst. Secretary, International Division, Ministry of Agriculture, Jalan Mahameru, Kuala Lumpur.
Nigeria	The Director	Agricultural Sciences Research Dept. Moor Plantation, Private Mail Bag No. 5382, Ibadan
Cyprus	Dr. A. Louca	Director-General, Ministry of Agriculture & Natural Resources, Nicosia
Sierra Leone	Senior Lecturer	Njala University College, University of Sierra Leone, PMB. Freetown
Tanzania	Director of Agriculture	Ministry of Agriculture, P.O. Box 9071, Dar-es-Salaam
Jamaica	Dr. R. J. Barker	Research & Development Division, Ministry of Agriculture, P.O. Box 480, Kingston 6
Trinidad & Tobago	Chief Technical Officer (Crop Research)	Ministry of Agriculture, Lands and Food Production, Research Div. Central Experiment Station, Centeno, P.O., Arima, Trinidad & Tobago
Uganda	Permanent Secretary	Ministry of Agriculture & Forestry, P.O. Box 102, Entebbe
Kenya	W. W. Wapakala	Ministry of Agriculture, P.O. Box 30028, Nairobi
Malawi	Chief Agricultural Research Officer	Ministry of Agriculture & Natural Resources, P.O. Box 30134, Capital City, Lilongwe 3
Zambia	Mr. Edward Lumande Librarian	Mount Makulu Central Research Station, PO Box 7, Chilango
The Gambia	Permanent Secretary	Ministry of Agriculture & Natural Resources, The Quadrangle, Banjul
Guyana	Dr Michael Granger Director	National Agricultural Research Institute, Georgetown, Guyana
Botswana	Permanent Secretary	Ministry of Agriculture, Common Service Division, Private Bag 0028, Gabarone
Mauritius	K. Lutchmeenaraidoo	Chief Agricultural Officer, Agricultural Service, Reduit
Fiji	Permanent Secretary	Ministry of Agriculture, Fisheries and Forests, Rodwell Road, Suva
Bangladesh	The Executive Vice-Chairman	Bangladesh Agricultural Research Council, New Airport Road, Farm Gate, GPO Box 3041 Dhaka, Bangladesh
The Bahamas	Director of Agriculture	Ministry of Agriculture, Fisheries & Local Government, P.O. Box 3028, Nassau
Papua New Guinea	The Secretary	Dept of Primary Industry, P.O. Box 417, Konedobu
Zimbabwe	Mr. R. J. Fenner	Ag. Director, Dept of Research & Specialist Services, Ministry of Agriculture, P.O. Box 8108, Causeway, Harare
Solomon Islands	Mr. Ezekiel Walaodo	Under Secretary (Agriculture) Ministry of Agriculture & Lands, P.O. Box G13, Honiara
Brunei Darussalam	Dr. Morni bin Othman	Dept of Agriculture, Ministry of Development, Negara, Brunei Darussalam.

page number

Bats as hosts of acanthocephalan parasites.
By D. I. Gibson and T. J. McCarthy 159

Stephanofilariasis:
a review by S. J. Johnson 287

The role of blood in helminth nutrition.
By Helen C. Jackson 427

Helminthological Abstracts

Series A Animal and Human Helminthology

CONTENTS VOLUME 56

Animal hosts	1	29	73	117	163	209	247	301	345	387	435
Man	1	–	73	117	163	209	247	301	345	387	435
Other primates	3	–	75	120	167	212	249	–	–	390	–
Equines	3	31	76	120	–	212	249	304	348	390	436
Ruminants	3	32	76	120	167	212	249	304	349	390	436
Pigs	4	34	77	–	168	214	250	–	350	392	437
Carnivores	–	35	78	121	169	214	250	305	350	393	438
Rodents, Insectivores and Lagomorphs	4	35	79	122	169	215	252	306	351	393	439
Marine mammals	5	–	79	–	170	–	–	306	–	393	439
Other mammals	5	36	80	122	170	215	–	306	352	394	–
Birds	5	36	80	122	170	–	252	307	352	394	439
Reptiles	5	–	80	–	171	–	252	307	–	395	–
Amphibians	–	–	81	123	171	215	–	–	–	–	439
Fish	5	37	81	123	171	215	252	307	352	395	439
Invertebrates	6	38	82	124	172	215	253	308	353	396	440
Mixed groups	7	39	82	125	172	216	255	310	354	398	441
General reviews	7	39	82	–	173	216	255	310	354	398	–
Associations	7	40	–	126	–	216	255	310	355	398	–
Morphology, taxonomy and nomenclature	7	40	82	126	173	217	255	310	355	398	442
Monogenea	7	40	82	126	173	217	255	310	355	398	442
Aspidobothria	7	–	–	–	–	217	–	–	356	–	–
Digenea	7	40	83	127	173	217	255	311	356	399	443
Cestoda	8	41	85	129	175	219	258	313	358	400	445
Cestodaria	8	42	85	–	–	220	–	–	359	402	–
Acanthocephala	8	–	85	129	177	220	259	314	359	402	445
Nematoda	8	42	86	130	177	220	260	314	359	403	445
Nematomorpha	–	–	–	–	179	–	262	315	–	405	–
Miscellaneous	10	–	88	131	–	–	262	–	–	405	446
Immunity, serology and resistance	10	43	88	131	179	221	262	315	361	406	446
Pathogenesis and pathology	15	50	95	139	185	228	269	323	366	410	450
Biochemistry and physiology	16	53	97	141	188	231	271	326	369	413	452
Ecology and behaviour	18	56	104	143	193	233	274	329	373	415	454
Geographical distribution	19	–	104	–	194	–	275	330	–	416	–
Epidemiology and epizootiology	19	57	104	143	194	234	275	330	374	416	454
Control	20	58	105	145	196	236	276	332	376	417	457
Technique	26	66	111	154	201	243	281	339	382	422	464
Life-history	26	67	113	154	202	244	281	340	383	423	464
Cytology, genetics and evolution	26	69	114	156	202	244	283	341	385	424	465
Hirudinea	–	–	114	156	203	244	–	342	–	424	466
Unclassified	27	–	–	156	203	245	283	342	–	425	466
Reports	27	69	–	157	204	245	284	–	385	425	466
Conferences	27	69	114	157	204	245	284	342	–	425	467
Books	27	70	114	157	205	245	284	342	385	425	467

AUTHOR INDEX 469

SUBJECT INDEX 491

READERS GUIDE

The purposes of the citations and abstracts are to enable readers to: identify documents containing information of relevance and importance to their interests; keep themselves informed of the progress of current work; decide whether or not they need to see original documents. Abstracts may also act as substitutes for documents not available to readers or in language they cannot understand. Photocopies of most items abstracted are available through C·A·B International's Document Delivery Service. (see request form in this journal. The titles and abstracts in this journal have been added to the CAB ABSTRACTS database which is available for current and retrospective online searches.

In a typical entry the name(s) of the author(s) is followed by the title of the paper in English. If the original paper is not written in English then a translation of the title is enclosed in square brackets and the title of the original language follows (except for Arabic, Chinese, Japanese, etc). Cyrillic characters are transliterated for book titles but not for titles of papers. The unabbreviated journal title is given next (transliterated or romanised if necessary). The year of issue in round brackets, volume number, part number in round brackets, and first and last page numbers of the article complete the basic citation.

Supplementary information, given in square brackets, includes the language of the paper (see abbreviations) and language(s) of additional summary(ies) and the number of references cited in the paper.

The address cited for an abstract normally refers to the first author and is usually the place where the work was carried out.

Authors summaries are used for the abstracts if suitable. Special efforts are made to provide informative abstracts of papers in less commonly used languages and in publications which cannot easily be obtained. In consulting an entry the reader should remember that the title of the paper is an integral part of the abstract and may include information necessary for its full comprehension. Names or phrases in square brackets within a title or abstract have been added during abstracting and do not appear in the original document.

ABBREVIATIONS FOR LANGUAGES

An initial capital letter denotes the language of the paper, an initial small letter the language of a summary.

Afrikaans	Af	Finnish	Fi	Malay, Bahasa Malaysia	My
Albanian	Al	French	Fr	Dutch, Flemish	Nl
Arabic	Ar	Greek	Gr	Norwegian	No
Azerbaijani	Az	Hebrew	He	Persian	Pe
Byelorussian	Be	Hungarian	Hu	Polish	Pl
Bulgarian	Bg	Interlingua	Ia	Portuguese	Pt
Chinese	Ch	Indonesian	In	Romanian	Ro
Czech	Cs	Icelandic	Is	Russian	Ru
Danish	Da	Italian	It	Serbo Croat	Sh
German	De	Japanese	Ja	Slovak	Sk
Estonian	Ee	Korean	Ko	Slovene	Sn
English	En	Latin	La	Swedish	Sv
Esperanto	Eo	Lithuanian	Li	Tajik	Ta
Spanish	Es	Latvian	Lv	Turkish	Tr
		Macedonian	Ma	Ukranian	Uk

HELMINTHOLOGICAL ABSTRACTS, SERIES A

VOLUME 56

AUTHOR INDEX

The reference is to the serial number of the citation. No distinction is made between abstract and title-only entries and there are no cross-references to show joint authorship. Thus a paper by "Brown, B.; Jones, A.; Smith, J." would have three separate entries: "Brown, B", "Jones, A.", and "Smith, J.". There is no distinction between subsidiary and senior authors. Apparent inconsistencies may appear in the spelling of authors' names; this is because variations in spelling occur in primary journals. Authors' names in this index are spelt as they appeared in the original paper. If we have knowledge of their identity, alternative versions may also be given.

HELMINTHOLOGICAL ABSTRACTS, SERIES A

VOLUME 56

SUBJECT INDEX

Beginning with Volume 52 the structure of the subject index of this journal changed slightly. This was partly due to the development of the *CAB Thesaurus* and partly to the need to conform to a standard index structure common to all CAB International journals. Most leading terms therefore conform to the preferred terms as listed in the *CAB Thesaurus* [copies are obtainable from CAB International (Central Sales), Farnham House, Farnham Royal, Slough, SL2 3BN, UK].

The reference is to the serial number of the citation. No distinction is made between abstract and title-only entries. The leading key word unit in an entry appears in **bold type**. Aggregation of entries sharing identical keyword units is indicated by indentation. Basically there are four levels of indentation – parasite, host, country, subject aspect.

Hosts are indexed under their specific names, where given, except domesticated animals (e.g. cats, pigs, sheep) and where numerous hosts of the same group are listed in the one paper (e.g. Amphibia, birds). The use of alternative scientific names for host or parasite is avoided wherever possible but in cases in which nomenclatorial or taxonomic confusion still exists the same organism may appear under more than one name.

In an index of this kind it is not possible to assume that any chosen entry will necessarily give complete coverage of the subject in question. After consulting the chosen entry it may be necessary to consult index entries for related larger or smaller groupings or for alternative names.

Thus, when the subject matter concerns organisms, whether host or parasite, entries concerned with related group, generic or popular names should be consulted, e.g.

Rodents, see also Animals, Mammals, Muridae, *Rattus*, Vertebrates, etc.

Cestoda, see also Helminths, *Hymenolepis*, Taeniidae etc.

A similar procedure is necessary with geographical entries, e.g.

East Africa, see also Africa, Kenya, Tanzania, Uganda

New records are indexed as "New host records" for the first record of the named parasite in the named host and by "New geographic records" for the first record of the named parasite in the named country or region.

Anthelmintics are indexed by their common name (where known), their trade name, protocode number, or by their chemical name. Wherever possible proprietary drugs are cross-referenced to the appropriate common name (as given in Bard, J.H., 1972, "Anthelmintic Index". *Tech. Comm. No. 43 of the Commonwealth Institute of Helminthology*). No classification of the drugs is attempted.